

## CLAIMS

1. A radiation applicator has a power input at one end, an elongate antenna extending axially of the applicator at its distal end, and a dielectric body which surrounds the antenna, the radiator serving to emit radiation radially of the antenna into surrounding material, characterised in that the dielectric body consists of multiple sections of different dielectric constant which are located axially relative to one another along the antenna.
2. An applicator as claimed in claim 1 in which, the dielectric body consists of a second section adapted to emit radiation, and a first section between the second section and the power input, and having a lower dielectric constant than the first section.
3. An applicator as claimed in claim 2 in which the dielectric body has an outer section furthest from the power input having a dielectric constant lower than that of the second section.
4. An applicator as claimed in claim 3 in which the outer section has a dielectric constant intermediate that of the first and second sections.
5. An applicator as claimed in any of claims 1 to 4 in which, the multiple sections are made as separate components and are assembled to abut against one another end-to-end.
6. An applicator as claimed in any of claims 1 to 5 in which, a radiation reflector is provided at the interface between two sections of the dielectric body so as to modulate the transmission of radiation and tune the applicator.

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7. An applicator as claimed in claim 6 in which, a radiation reflector is provided each side of a section which is intended to emit radiation into the surrounding material, a reflector on that side further from the input end having a larger area so as to reflect more energy than the reflector nearer the input end, thereby reducing transmission of radiation to the tip of the applicator.
8. A radiation applicator having a power input at one end, an elongate antenna extending axially at its distal end for emitting radiation into surrounding material, a dielectric body which surrounds the antenna, and one or more radiation reflectors located axially along the antenna within the dielectric body to modulate the transmission of radiation, characterised in that two radiation reflectors are spaced apart with the intermediate section of the dielectric body intended to emit radiation radially into the surrounding material, the reflector on one side further from the input having a larger area so as to reflect more radiation than the reflector nearer the input end, thereby reducing transmission of radiation to the tip of the applicator.
9. An applicator as claimed in any one of claims 6 to 8 in which, each reflector is located at the interface between separate sections of the dielectric body and gives structural support to the applicator.
10. An applicator as claimed in any one of the preceding claims in which the outer end of the dielectric body furthest from the power input is pointed.
11. An applicator as claimed in any one of the preceding claims in which the power input comprises a coaxial conductor in which the central conductor extends from the outer conductor to form said elongate antenna.
12. An applicator as claimed in claim 11 in which the dielectric body has a reduced diameter and which is inserted into the open end of the outer conductor.

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13. A radiation applicator having a power input at one end, an elongate antenna extending axially at its distal end for emitting radiation into surrounding material, and a dielectric body which surrounds that antenna, characterised in that the antenna extends through a hole in a section of said dielectric and through a hole in a radiation reflector attached to an axial end face of said section of dielectric body, and said radiation reflector is attached to the antenna so as to give structural support to the applicator.

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